THE CODE STONE
BY SUM BUNNY

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A Functional–Computational Hypothesis for an Undeciphered Basalt Tablet

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A Functional–Computational Hypothesis for an Undeciphered Basalt Tablet

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ABSTRACT

This paper presents a structural analysis of the Bashplemi Lake artifact, a basalt tablet featuring approximately 60 signs across seven horizontal registers. Lacking a bilingual "Rosetta" key or a known script family, phonetic decipherment is currently impossible. We propose a functional decipherment treating the tablet not as a narrative text, but as a rigid data processing system. Analysis of symbol distribution, frequency, and clustering indicates a layout consistent with a typed administrative calculus utilizing a mixed-radix counting system. We identify distinct symbol classes corresponding to quantities, procedural operators, unit markers, and an embedded reference table. We argue that the object's structure is best explained as a formal administrative device or closely related accounting instrument in function—a permanent hardware implementation of an algorithm designed for verifying and sealing economic transactions. This implies that in this context, writing may have functioned as a tool for the institutional stabilization of exchange claims, distinct from narrative traditions.

1. THE ARTIFACT AND THE PROBLEM

1.1 Discovery, Description, and Dating

The artifact was recovered in autumn 2021 from the littoral zone of Bashplemi Lake (Dmanisi Municipality, Georgia) by local residents. It is a distinct, rectangular slab of vesicular basalt, measuring approximately 24.1 × 20.1 cm. The surface features seven horizontal registers carved with high precision. The manufacturing technique appears to involve conical drilling followed by abrasive smoothing to connect the punctures into linear forms. While absolute dating remains elusive due to the lack of stratigraphic context, the technological style and discovery region have been suggested to indicate a Late Bronze Age to Early Iron Age origin (roughly 1st millennium BCE). This period coincides with a significant expansion of metallurgical production and social complexity in the South Caucasus (Sagona, 2018). The text consists of approximately 60 symbols drawn from a lexicon of 39 unique signs.

1.2 The Epigraphic Standoff

Traditional epigraphic methods face three significant barriers:

1. Isolation: No bilingual text exists to bridge the gap to a known language.

2. Opacity: The script belongs to no known paleographic family, though visual comparisons have been drawn to various regional traditions without definitive assignment.

3. Rigidity: The strict, register-based formatting and high repetition of symbol clusters suggest a formulaic structure (e.g., administrative, legal, or ritual) rather than the entropic flow of natural narrative prose.

1.3 Research Question

If the object is not "reading" in the narrative sense, what is it doing? We posit that the physical structure of the text describes a logic operation. The research question shifts from "What do these words mean?" to "How does this system function?"

2. METHOD: FUNCTIONAL DECIPHERMENT

2.1 Principle: Black Box Analysis

We apply a method common in systems analysis. By bracketing specific phonetic values, we focus exclusively on symbol roles determined by their position and interaction with neighboring signs.

2.2 Role Classes

We categorize symbols into four functional domains based on distribution:

- QTY (Quantity marks; possibly numerals): High-frequency, repetitive stroke clusters.
- OP (Operators): Delimiters and action-indicators.
- NOUN (Category Tokens): Unique, complex pictographs representing items.
- META (Validation): Symbols appearing exclusively at termination points.

3. VISUAL ARCHITECTURE OF THE TABLET

The seven registers (R1–R7) form a hierarchical data structure. Unlike a continuous narrative, the layout functions as a "stack," where each level performs a specific logical role in the transaction.

Figure 1. Schematic representation of the seven-register layout of the Bashplemi tablet.

R1: HEADER / CONTEXT (Authority or Location)

R2: ROSTER (List of Category Tokens)

R3: ENTRIES (Quantified Transaction Data) R4: ENTRIES (Quantified Transaction Data)

R5: BOUNDARY (Subtotal Delimiter Line)

R6: REFERENCE TABLE (Unit Definitions / Conversion)

R7: CLOSURE (Audit, Total, and Seal)

4. THE OPERATOR SYSTEM: A PROCEDURAL CALCULUS

We propose that the tablet encodes a procedure. The non-numeric symbols act as a formal operator set that dictates how the human agent should treat the adjacent quantities.

4.1 Interpretive Restraint

The computational labels used below (e.g., "COMMIT", "VALIDATE") are functional analogies intended to describe the procedural ordering of the script. They do not imply that the ancient scribes possessed mechanized cognition, but rather that they employed a strict, algorithmic approach to data management.

4.2 Identified Operator Classes

Symbol Family: Hammer-bar

Structural Role: Pre-Numeral Prefix

Proposed Administrative Function: Modifier / Multiplier

Symbol Family: Colon Stack

Structural Role: Separator

Proposed Administrative Function: Item Delimiter / Syntactic Particle

Symbol Family: Long Bar

Structural Role: Horizontal Boundary

Proposed Administrative Function: Subtotal Line

Symbol Family: Disc Marks

Structural Role: Check-mark

Proposed Administrative Function: Verification / Witness Mark

Symbol Family: Spiral

Structural Role: Terminal Delimiter

Proposed Administrative Function: Ledger Closure / Totalizer

Symbol Family: Rake

Structural Role: Final Impression

Proposed Administrative Function: Seal / Authorization

(Note: While an administrative function is the primary hypothesis, alternative interpretations cannot be fully excluded. For example, "Disc Marks" could function as deity determinatives, and the "Rake" could represent a clan emblem or ritual dedication.)

4.3 The Operator Pipeline

Following the text from top to bottom, the operator sequence creates a logical pipeline. This sequence is structurally equivalent to a state transition system, guiding the user from a state of "unverified inventory" to "verified, sealed account."

Figure 2. Proposed logical pipeline of operator classes and state transitions.

MEASURE → NEXT → SUBTOTAL

↓

COMMIT ← TOTALIZE ← VALIDATE

(Arrows indicate procedural sequence, not temporal duration.)

5. NUMBER SYSTEM: ALTERNATING RADIX HYPOTHESIS

5.1 Observation

The text features "three-stroke" signs in three distinct orientations: vertical, horizontal, and diagonal. Here we treat these as candidate quantity marks for hypothesis-testing; their numeric status is not assumed a priori.

5.2 Working Model A: Alternating Radix (10:6)

We propose a Mixed-Radix heuristic as the primary model. This mirrors Archaic bisexagesimal systems where the unit value alternates factors (e.g., 1 → 10 → 60).

- Class 0 (Vertical): Base Unit (n).

- Class 1 (Horizontal): Decadal Unit (10n).
- Class 2 (Diagonal): Sexagesimal Unit (60n).

5.3 Competing Models & Uncertainty

To ensure robustness, we consider alternative interpretations:

1. Commodity-Class Hypothesis: Orientation denotes the nature of the good. (Contra-indication: Requires an unwieldy number of orientations for a complex economy.)
2. Grammatical Hypothesis: Orientation acts as a grammatical marker. (Contra-indication: Repetition of identical clusters is inconsistent with linguistic pluralization.)

We explicitly acknowledge that the specific factor pair (10, 6) is inferred. While these factors are dominant in Near Eastern metrology, the mathematical structure could theoretically support other alternating pairs (e.g., 12 and 5). However, (10, 6) represents the lowest-assumption solution that satisfies the visual magnitude jumps without requiring unique factors for this single artifact.

6. UNIT-CLASS MARKERS AND TYPED QUANTITIES

Certain candidate quantity marks are appended with curved "bow" attachments. We identify these as Unit-Class Markers. In a computational analogy, this functions similarly to "type casting," modifying the semantic class of the number (e.g., distinguishing "Seed Grain" from "Feed Grain").

7. REGISTER 6 AS A METROLOGY REFERENCE TABLE

7.1 Structural Evidence

Register 6 is anomalous. It contains dense category glyphs adjacent to quantity markers but lacks the listing format of R3-R4.

7.2 Interpretation: The Interlocking Constraint

We recognize the potential circularity in identifying Register 6 as a reference table based on the arithmetic needs of the other registers. However, this hypothesis solves two problems simultaneously: it explains the anomalous density of category glyphs in R6, and it provides the necessary conversion logic to balance the ledger.

8. LEDGER GRAMMAR

The syntax of the tablet can be formalized as:

1. Core Clause: CATEGORY × NUMBER × UNIT

2. Tablet Program: HEADER → ENTRIES → SUBTOTAL → CONVERSION_LOGIC → AUDIT → CLOSE → SEAL

3. THE SPIRAL AS TERMINAL OPERATOR

The "Spiral" appears only once at the terminal position. While ritual closure or authority markers are possible, we posit Summation/Locking as the most economical administrative interpretation. The symbol acts as a functional delimiter, signifying: "The list ends here; the Sum follows."

10. WHY BASALT MATTERS: THE ECONOMICS OF PERMANENCE

10.1 Cost of Inscription

Basalt requires high-effort abrasive tooling. The labor cost of inscription implies that the recorded transactions were of significant value (e.g., treaties, land deeds, or tribute) rather than ephemeral exchanges.

10.2 Consequences: Immutable Storage

The medium enforces Tamper Resistance. This parallels the function of the Mesopotamian Kudurru (boundary stones) and Narû (monumental steles), which served as permanent legal witnesses to land grants and divine decrees, distinct from the clay tablets used for daily accounting (Slanski, 2000).

10.3 The Terminal Storage Argument

The impossibility of erasure suggests this artifact served as a terminal storage device for data calculated elsewhere (e.g., on clay or wax). This interpretation is compatible with legal/ritual monumental functions; the argument here is that the register structure combined with the closure/seal grammar is especially consistent with administrative closure. The "Code Stone" is a record of the result, not the scratchpad for the process.

11. FALSIFIABILITY

This hypothesis is falsifiable. It predicts:

1. Clustering: Candidate quantity marks must always cluster near "Measure" operators.

2. Boundary Logic: The "Long Bar" must only occur at logical block boundaries.

3. Arithmetic Consistency: The sums in the final register must mathematically match the inputs when the conversion rules of R6 are applied.

4. IMPLICATIONS

12.1 Institutional Stabilization

The tablet suggests that in this context, formal symbolic systems were developed for the institutional stabilization of exchange claims. This supports the position that data processing is a distinct evolutionary root of writing, potentially independent of narrative traditions.

12.2 Externalization of Calculation

The tablet represents a fusion of medium and procedure, serving as a device that externalizes the calculation, rendering it auditable and permanent.

13. CONCLUSION

The Code Stone of Bashplemi Lake appears best modeled not as a primitive attempt at literature, but as a sophisticated formal administrative system. It executes typed arithmetic, subtotaling, normalization, verification, and closure. It is software carved into stone. Before writing told stories, it balanced books.

APPENDIX A: STRUCTURAL SOLVABILITY AND HEURISTIC RECONSTRUCTION

A.1 Structural Solvability Proof

Irrespective of specific values, the tablet demonstrates internal consistency.

- Let R3, R4 be inputs; R6 be a conversion function f; R7 be the output y.
- The structure holds if f(Sum(R3, R4)) = y.
  The visual grouping of symbols suggests such a relationship exists.

A.2 Numerical Illustration (Non-binding)

Note: This specific reconstruction uses the Model A (10:6) heuristic. It illustrates logical feasibility but does not constitute absolute proof.

- Inputs (R3 & R4):
  - 3 × 60 (Diagonal) = 180
  - 3 × 10 (Horizontal) + 4 × 1 (Vertical) = 34
  - 3 × 10 (Type B) × 10 (Conversion) = 300
- Summation: 180 + 34 + 300 = 514
- Visual Prediction: If the heuristic holds, R7 should logically encode 514 Base Units.

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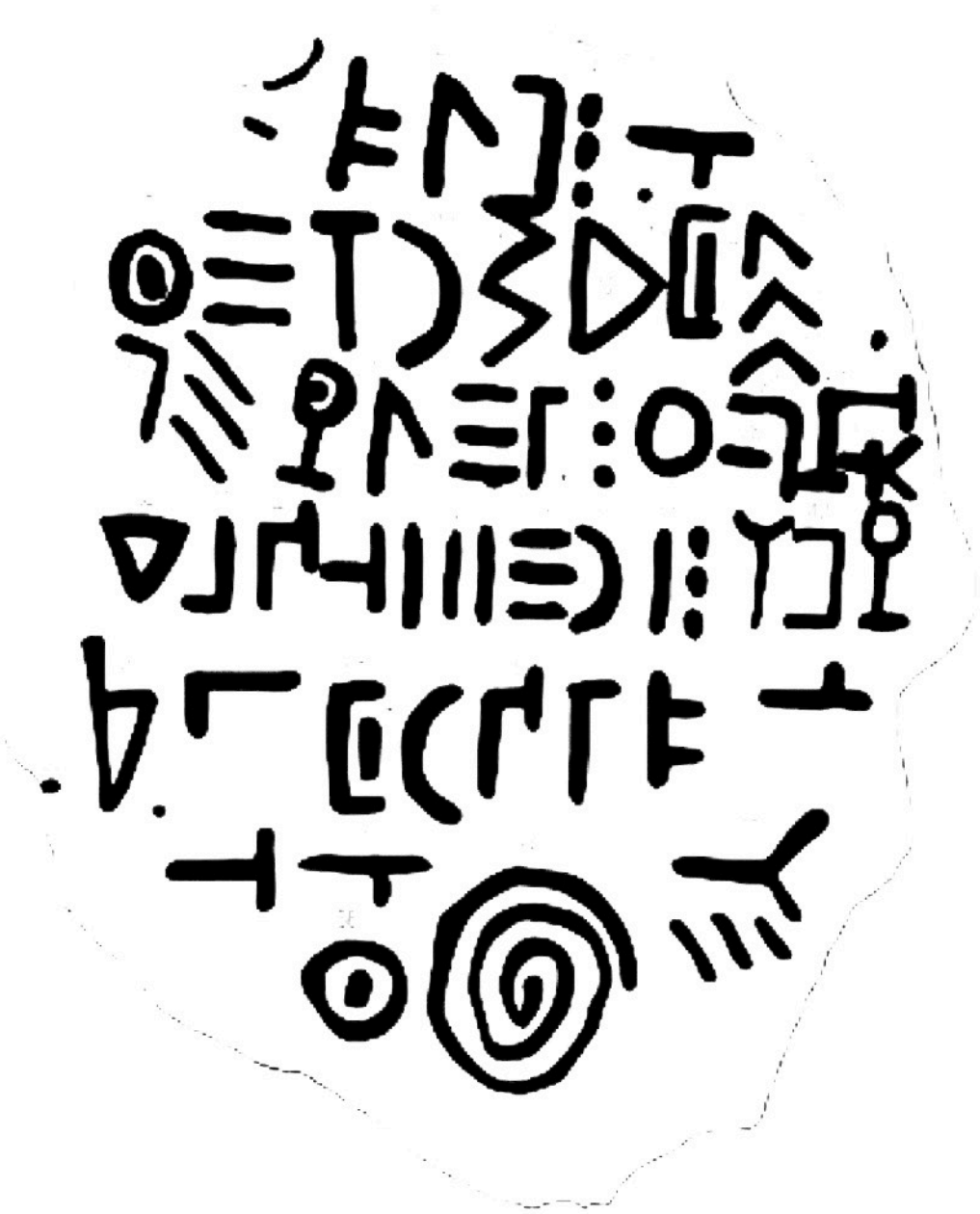
This was written through a collaboration between a human author and AI systems acting as analytical tools. The machines provided structure; the human provided judgment. Nothing appears here that the author did not personally create, refine, choose, and claim.

HEY JOSIANE,
WE COUNT OUR DOLLARS ON THE TRAIN TO THE PARTY.
SUM BUNNY LOVES YOU!!!



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